PB89-204838

# Superfund Record of Decision (EPA Region 7) Shenandoah Stables, Missouri (First Remedial Action), July 1988

(U.S.) Environmental Protection Agency, Washington, DC

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16. Abstract (Limit: 200 words)

The Shenandoah Stables (SS) site is located in a rural area near Moscow Mills, Lincoln County, Missouri, approximately 35 miles northwest of St. Louis, Missouri. The property includes an enclosed arena and horse stables. There are about 8 residences located within a 0.5 mile radius of the site, as well as a livestock operation, and other small businesses on approximately 5- to 10-acre parcels around the facility. The site lies in the upper flood plain of Crooked Creek. In May 1971, the area inside the arena was sprayed with dioxin-contaminated waste oil for dust control purposes. There are reports that 1,500 gallons of waste material were applied at this time. Following this spraying, a number of adverse effects were noted; horses and other animals became ill or died, and the six-year-old daughter of one of the owners was hospitalized for a variety of symptoms assumed to be related to exposure to contaminated soil. Between August 1971 and March 1972, approximately 24 to 26 inches of the contaminated material was removed and disposed of either offsite or onsite in two removal episodes. Investigations were conducted by EPA in May 1982, which indicated continued exterior and interior contamination of the facility by dioxin at levels greater than 1,750 ug/kg. Since the spraying, the site has been flooded a number of times, with water levels inside the arena as high as four feet above the arena floor. Investigations have shown

(See Attached Sheet)

17. Document Analysis a. Descriptors

Record of Decision
Shenandoah Stables, MO
First Remedial Action
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Key Contaminants: dioxin

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EPA/ROD/R07-88/012
Shenandoah Stables, MO
First Remedial Action

16. ABSTRACT (continued)

contamination of approximately 8,600 $yd^2$ of interior and exterior site areas. The primary contaminant of concern affecting the soil and structures at the site is dioxin.

The selected remedial action for this site includes: excavation of all dioxin-contaminated surface soil exceeding 1 ug/kg with continued excavation until a residual concentration of 5 to 10 ug/kg at the 2 to 4-foot depth is reached in the arena and slough, or excavation until bedrock is encountered, with backfilling of excavated area, placement of the excavated soil in lined polypropylene bags, and storage of the bags in RCRA-equivalent enclosed steel storage structures onsite; and decontamination of onsite structures. Approximately 3,300 $yd^3$ of soil are expected to be excavated and stored. The estimated present worth cost for this remedial action is $3,936,500.

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R07-88/012
July 1988

PB89-204838

EPA

# Superfund Record of Decision:

## Shenandoah Stables, MO

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

# RECORD OF DECISION

# FOR

# NON-FINAL MANAGEMENT OF DIOXIN-CONTAMINATED SOIL AND STRUCTURES AT

# SHENANDOAH STABLES

# MOSCOW MILLS, MISSOURI

**Prepared by:**

**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**JULY 1988**

# RECORD OF DECISION DECLARATION

## SITE NAME AND LOCATION

- Shenandoah Stables, Moscow Mills

## STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected non-final remedial action for the Shenandoah Stables site in Moscow Mills, Missouri. This plan has been developed in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Contingency Plan. This decision is based on the administrative record for this site. The attached index identifies the items which comprise the administrative record upon which the selection of the remedial action is based.

## DESCRIPTION OF THE SELECTED REMEDY

This remedial action represents the non-final remedial action for dioxin-contaminated soils and structures at the Shenandoah Stables site. This remedial action addresses the principal threats at the site by excavation and onsite storage of soils which exceed the 1 ppb action level established for the protection of public health and the environment in residential areas.

The major components of the selected remedial action include:

- Excavation of all dioxin-contaminated soils exceeding the health based criteria - excavate surface soils exceeding 1 ppb at the 95 percent confidence level using the established sampling protocol, continue excavation until a residual concentration of 5 to 10 ppb is reached in the arena and slough at the 2- to 4-foot depth interval or to the 1-foot depth interval in other areas, or until the 4-foot depth or bedrock is encountered;
- Placement of excavated soils in lined polypropylene bags and storage of the bags in RCRA-equivalent enclosed steel storage structures onsite;
- Decontamination of onsite structures.

## DECLARATION

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate to this remedial action and is cost-effective. Section 121 of CERCLA identifies a statutory preference for treatment that reduces toxicity, mobility or volume of hazardous substances. The selected remedy described in this document is a non-final action that will the reduce the toxicity and mobility of the hazardous material onsite. However, treatment will not be addressed at this time. Treatment will be addressed during consideration of the final remedial action alternatives.

7-28-88

Date

Morris Kay
Regional Administrator
Region VII

# RESPONSIVENESS SUMMARY

# RECORD OF DECISION

# FOR

# NON-FINAL MANAGEMENT OF DIOXIN-CONTAMINATED SOIL AND STRUCTURES AT

# SHENANDOAH STABLES

# MOSCOW MILLS, MISSOURI

**Prepared by:**

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## RESPONSIVENESS SUMMARY

Record of Decision for
Non-Final Management of Dioxin-Contaminated
Soil and Structures at
Shenandoah Stables
Moscow Mills, Missouri

The Responsiveness Summary provides a mechanism for the Environmental Protection Agency (EPA) to discuss and respond to comments received from the public on the proposed remedial alternatives. The proposed non-final alternatives considered by the Agency were presented in the Operable Unit Feasibility Study (OUFS) and Proposed Plan for Non-Final Management of Dioxin-Contaminated Soil and Structures at Shenandoah Stables in Moscow Mills, Missouri.

As required by CERCLA, a notice and brief analysis of the Proposed Plan were published on June 19, 1988, in the St. Louis Post Dispatch. The public notice provided a brief overview of the site and identified the lead agency (EPA) and the support agency (MDNR). The notice informed the public of its role in the decision-making process and provided information on the public comment period, the location of the information repositories and methods by which the public could submit oral and written comments. The notice also presented the preferred alternative and requested public comments on the alternatives considered.

To provide the community with a reasonable opportunity to submit written and oral comments on the Proposed Plan and the OUFS report, the EPA established a public comment period from June 20 through July 11, 1988. The EPA invited requests for a public meeting in the community to present the Proposed Plan and OUFS, answer questions and receive comments.

The Proposed Plan, OUFS and Administrative Record file were made available for public review at the Moscow Mills City Hall and at the EPA Region VII Library in Kansas City, Kansas. No comments were received by EPA or the State on the OUFS, Proposed Plan, the preferred alternative or the Administrative Record file during the public comment period. No request were received to conduct a public meeting.

# DECISION SUMMARY

# RECORD OF DECISION

# FOR

# NON-FINAL MANAGEMENT OF DIOXIN-CONTAMINATED SOIL AND STRUCTURES AT

# SHENANDOAH STABLES

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**JULY 1988**

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# 1.0 INTRODUCTION

## 1.1 SITE SETTING/DESCRIPTION

The Shenandoah Stables facility is located in a rural area along Highway US-61 near Moscow Mills, Lincoln County, Missouri, approximately 35 miles northwest of St. Louis, Missouri. Specifically, Shenandoah Stables lies in the west 1/2, northeast 1/4 of section 17, township 48N, range 1E of the Troy 7.5 minute USGS quadrangle. The property lies on the upper flood plain terrace of Crooked Creek in a primarily agricultural area. There are a number of single family residences, a livestock operation and other small businesses on approximately 5- to 10-acre parcels around the facility. The predominant land use would appear to be pasture land which is primarily vegetated with fescue.

The property includes an enclosed arena and horse stables building containing a 78.5-foot by 189-foot horse arena, and nearly 100 boarding stalls. The stables are located on the south side of the arena and are separated by a wall which stops about one foot from the roof trusses. The enclosed arena building previously contained bleachers with a capacity for more than 300 spectators and a combination snack bar and clubhouse area. The arena structure is principally a wood frame structure with wood poles and trusses and supports and sheet metal walls. Additionally, wood was used in the construction of the snack bar, stable area, bleachers and gates.

During the early 1970's, activities at the Shenandoah Stables included the boarding, training and sale of horses, and the staging of horse shows. Children periodically played in various parts of the arena building. The area inside the arena was sprayed with dioxin-contaminated waste oil on May 26, 1971, for dust control purposes. It has been reported that 1,500 gallons of waste material were applied at this time. Following this spraying, a number of adverse effects were noted; horses and other animals became ill or died and the six-year old daughter of one of the owners was hospitalized for a variety of symptoms assumed to be related to exposure to contaminated soils. In August of 1971, the facility owner reportedly removed 6 to 8 inches of the contaminated material and disposed of it in the fill for a portion of US-61, which was under construction at the time. Horses continued to die after the first excavation effort conducted by the stables owner in March 1972, an additional 18 inches of materials were reportedly removed by the site owner from the arena area and buried onsitein a slough area about 75 feet southeast of the arena structure.

Approximately eight residences are located within a half-mile radius of the site. A preliminary survey indicates that approximately 22 residents live within the half-mile radius of the site.

## 1.2 PAST INVESTIGATIVE AND MITIGATION ACTIONS

A total of four site investigations have been conducted by the Environmental Protection Agency (EPA) or its contractors and one by the U.S. Fish and Wildlife Service (USFWS) since the initial screening effort in May 1982, confirmed the presence of dioxin at this site. These investigations have shown exterior and interior contamination of the facility by dioxin at levels greater than 1750 parts per billion (ppb) dioxin. Concentrations of dioxin have spread from the original sprayed area to adjoining portions of the enclosed facility and to several outside

exposure leads to altered liver functions and lipid metabolism, and neurotoxicity. In addition, humans may develop skin lesions, chloracne and hyperpigmentation.

The available epidemiologic evidence concerning the carcinogenicity of dioxin in humans is inadequate. Considering the available animal carcinogenic and epidemiologic data, however, the overall weight-of-evidence classification categorizes dioxin (using EPA's interim classification scheme) as a probable human carcinogen.

Polychlorinated dibenzo-p-dioxins are a class of chlorinated tricyclic aromatic hydrocarbons consisting of two benzene rings connected by a pair of oxygen atoms. According to the position and number of chlorine atoms, it is possible to form 75 different types of chlorinated dioxins. The word "dioxins" is often used to refer to this class of compounds, especially with respect to the highly toxic 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) that is present at Shenandoah Stables. This class of compounds is rather stable in the presence of heat, acids and alkalis. They are also chemically stable and start to decompose only at temperatures greater than 500 degrees Celsius; the percent of decomposition depends upon the residence time at high temperature and the proportion of oxygen in the heated zone.

Physico-chemical properties suggest that dioxin will adsorb tightly to organic material in soil, resulting in low mobility. Once in the soil, degradation processes tend to be very slow, with half lives estimated to be ten years or longer.

Experimental results show that dioxin will accumulate and concentrate in fish and wildlife. In mammals, dioxin is readily absorbed through the gastrointestinal tract. Absorption through skin has also been reported. Absorption may decrease dramatically if dioxin is adsorbed to particulate matter such as activated carbon or soil. After absorption, dioxin is distributed to tissues which are high in lipid content; however, in many species the liver is a major storage area for dioxin. Metabolism of dioxin occurs slowly, with metabolized dioxin excreted in the urine and feces. Unmetabolized dioxin can be eliminated in the feces and in the milk.

### 1.4.2 Risks to Human Health and the Environment

Continued long-term direct contact with soils, ingestion of soils or inhalation of particulates contaminated with dioxin present the greatest threat to human health. The principal concern would be for intruders who may disturb contaminated soils. Ingestion of dioxin would occur if biota containing levels of dioxin were consumed or by direct ingestion of site soils. Wildlife (deer, turkey, rabbits) entering the site area would be susceptible to contamination.

Ingestion of plants grown in contaminated soil represents a potential exposure route, although there is uncertainty regarding the potential for uptake of dioxin in plant life. Dioxin uptake in many plants appears to be minimal.

The site lies in the upper floodplain of Crooked Creek. A potential exists for surface contamination to reach Crooked Creek via stormwater.

The Center for Disease Control, through the Agency for Toxic Substances and Disease Registry (ATSDR) has recently provided supplemental information to the 1984 paper by Kimbrough, et al., in a series of correspondence between ATSDR and EPA which evaluates exposure to dioxin contaminated soils. This information has supported excavation and removal of surface soils exceeding an average concentration of one part per billion (ppb), initially determined prior to excavation at the 95 percent confidence level using the established sampling protocol. In addition, the ATSDR has recommended that excavation continue until: a residual concentration of 5 to 10 ppb is reached in the arena and slough at the 2- to 4-foot depth interval; a residual concentration of 5 to 10 ppb is reached in all other areas at the 1-foot interval; or a total depth of 4 feet or bedrock is reached. Removal of soil to a greater depth in the horse arena and slough has been recommended since historical evidence indicates these areas were previously disturbed. The Agency has considered this information and these recommendations in the process of selecting this non-final remedy.

### 1.5 DOCUMENTATION OF SIGNIFICANT CHANGES

The selected remedy presented in this document is identical to the remedy proposed in the EPA Proposed Plan of June 1988.

## 2.0 ALTERNATIVES EVALUATED

The EPA evaluated three alternatives proposed for the non-final remediation of Shenandoah Stables. The non-final remedial alternatives considered during this evaluation were 1) no action, 2) cap and 3) excavation/storage. A description of the alternatives is provided below.

### 2.1 ALTERNATIVE 1 - NO ACTION

Under the no-action alternative, no additional remedial actions would be taken at the site. Installation of security fencing and posting of warning signs may be considered part of this alternative.

### 2.2 ALTERNATIVE 2 - CAP

The primary components of this alternative are limiting public access, demolition of site structures, placement of a six-inch soil cover and porous mat over the demolition debris and ground surface and promoting vegetation by seeding and fertilization. This alternative would serve to provide a stable cover over site grounds thus reducing erosion potential. The site would be maintained and monitored until final remedial actions are implemented (assume approximately 10 years).

### 2.3 ALTERNATIVE 3 - EXCAVATION/STORAGE

This alternative would involve decontaminating existing onsite structures and excavation of surface soils at the site that are contaminated at concentrations exceeding the health based criteria. Surface soils exceeding an average concentration of 1 ppb, initially determined prior to excavation at the 95 percent confidence level using the established sampling protocol, will be excavated. Excavation of soil would proceed until a residual concentration of 5 to 10 ppb is

The no action alternative would essentially maintain the conditions as described and allow the continued potential for dioxin migration offsite. The migration of contamination is expected to continue and possibly increase as the unauthorized trespass and activities are conducted at the arena. Contamination is also leaving the site and entering the environment via wildlife through the food chain. The potential for offsite migration via wind and water erosion will also continue. Proper containment of the contaminated material is the only means to mitigate or eliminate the continued migration of dioxin into the environment.

The cap alternative would provide a reduction in dioxin migration via surface water, air and area biota. Subsequently the threat of exposure to site workers or intruders, intruding wildlife and downstream biota would be reduced. However, long term maintenance would be required to assure the caps integrity. Borrowing animals, erosion and other environmental and man induced conditions could compromise the caps integrity.

The excavation of dioxin contaminated soils would remove the threat of exposure. Excavation would remove dioxin contamination to a level below health based criteria. Short-term potential migration may be experienced during soil disturbance activities. However, the long-term degree of protection significantly outweighs the short-term impacts, by eliminating the contaminant source and greatly reducing the potential for dioxin migration over the long-term. Dust and particulates may be generated during materials handling and preparation activities. Measures would be taken to ensure that these potential hazards are controlled prior to full-scale operation. Workers would be protected through mitigative measures, project-specific health and safety plans and by adherence to Occupational Safety and Health Act (OSHA) regulations. During onsite remedial activities continuous ambient air monitoring will be conducted around the site.

## 3.2 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Section 121(d) of CERCLA, as amended by SARA, requires that remedial actions comply with applicable or relevant and appropriate requirements (ARARs) under Federal and State environmental laws. The following potential ARARs have been identified and evaluated for remedial alternatives at Shenandoah Stables:

- o Resource Conservation and Recovery Act
- o Toxic Substance Control Act
- o Federal and State Water Quality Criteria
- o Federal and State Air Pollution Control Requirements

Those ARARs which have the most substantial impact on the remedy selection are discussed below.

disposal of PCB items are located at 40 CFR 761.65. The Federal TSCA regulations are applicable to the Shenandoah Stables site since concentrations of PCB's have been detected at levels exceeding 50 ppm. The selected remedial action will comply as necessary with the technical requirements of TSCA.

### 3.2.3 Federal and State Water Quality Criteria

Federal ambient water quality criteria (established pursuant to Section 303 of the Clean Water Act at 40 CFR Part 120) provide an estimate of the ambient surface water concentration that will not result in adverse health effects in humans, or the concentrations associated with certain incremental cancer risks. Federal and state ambient water quality criteria for PCBs and 2,3,7,8-TCDD are zero. Federal and state ambient water quality criteria represent enforceable regulatory standards, and are applicable to any alternative involving discharge into the Crooked Creek. Runoff carrying soil particles will be controlled during implementation of the selected remedial action to eliminate non-point discharges of dioxin or PCB to Crooked Creek. No point source discharges will be made to Crooked Creek as a part of the selected remedy.

### 3.2.4 Federal and State Air Pollution Control Requirements

The technical and administrative requirements of the Federal and Missouri Clean Air Acts specify air quality standards and regulate hazardous substance emissions from stationary sources. The Missouri Air Pollution Control Regulations, administered by the Air Conservation Commission at 10 CSR 10 regulate contaminant and particulate air emissions from a variety of sources. These requirements applicable to the selected remedial action at Shenandoah Stables which may result in emissions of air contaminants of fugitive particulate matter (dust) will be addressed in the design and implementation of the remedial action.

## 3.3 REDUCTION OF TOXICITY, MOBILITY OR VOLUME

This evaluation criteria relates to the performance of a technology or remedial alternative in terms of eliminating or controlling risks posed by the toxicity, mobility, or volume of hazardous substances.

Dioxin contaminated soil would remain in place under the no action and cap alternatives. Capping would reduce mobility of contaminated soils. However, the toxicity of the contaminants would remain at current levels. If in the future it is determined that removal of contaminated soil is required, removal of the uncontaminated cover material would also be necessary. It would be difficult to completely segregate the cover material from the underlying contaminated soil during removal. Thus the volume of material possibly requiring future management would be increased by the additional volume of the cover.

Excavation of all soils contaminated with dioxin above the health based action level will provide the greatest assurance against contaminant migration. The toxicity and volume of dioxin contaminated soils would remain the same, however, contaminant mobility would be eliminated. The selected method of soil storage will contain soils in lined polypropylene bags and contain those bags in an enclosed storage structure. This method provides assurances that mobility and risk of

## 3.6 IMPLEMENTABILITY

Implementability addresses how easy or difficult, feasible or infeasible, an alternative would be to carry out from design through construction, operation and maintenance.

The no action alternative would easily be implemented since it requires minimal if any coordination of activity. Implementation of the cap alternative will require detailed design and competent supervision. Implementation time is approximately 2 months.

Implementation of the excavation and storage alternative requires the careful design and operations planning, considering many ongoing and simultaneous activities. Similar actions have successfully been implemented at several other dioxin contaminated sites in Missouri. Experienced gained during these related activities have provided a means for the Agency to refine and perfect the protocol and procedures implemented during the site remedial action. This alternative could be implemented immediately and completed in approximately 25 weeks.

## 3.7 COST

CERCLA requires that EPA select the most cost-effective (not merely the lowest cost) alternative that protects human health and the environment and meets other requirements of the law. The no action alternative, which would not involve any cost, was considered in order to meet requirements of the law. The cap alternative would involve costs of approximately $ 1.377 million in comparison to the excavation and storage alternative which would involve a cost of approximately $4.0 million. See Table 3.7 for itemized costs.

Considering the increased protectiveness and long-term reliability of excavating dioxin contaminated soils, the impacts associated with the costs of the non-final remedy, the most cost effective alternative is excavation and storage. The costs of the excavation/storage alternative in excess of those for the cap alternative are justified since the final remedy currently planned will require excavation of dioxin contaminated soils. The increased volume of the cap materials would subsequently increase final remedy costs. The advantages offered by excavation and storage thus far outweigh those offered by other alternatives.

## 3.8 COMMUNITY ACCEPTANCE

This evaluation criteria addresses the degree to which members of the local community support the remedial alternatives being evaluated.

The local community has not recently expressed concern over remediation of the Shenandoah Stables site. This Proposed Plan stands as the first presentation to the public of the alternatives considered.

The Proposed Plan, Operable Unit Feasibility Study and Administrative Record were provided at the Moscow Mills City Hall (repository) on June 20, 1988. A Public Comment Period was held open for 21 days, until July 11, 1988. No persons visited the repository during this period. The EPA received no comments, otherwise, to the Proposed Plan and no requests for a public meeting were received.

Table 3.7

COST SUMMARY ESTIMATE FOR EXCAVATION/STORAGE ALTERNATIVE

| | |
|---|---|
| **CONSTRUCTION COSTS** | |
| U.S. EPA Dioxin Excavation Contract | $ |
| Site Security at $250/day | 33,250 |
| Mobilize and Prepare Health & Safety Plan | 75,000 |
| Mobilization of Excavation Equipment | 20,000 |
| Site Management, Trailer and Utilities | 132,000 |
| Excavation and Interior Decon | 2,250,000 |
| Backfill Soil @ $10/yd | 37,500 |
| Restoration | 50,000 |
| Other Supplies | 25,000 |
| Subtotal of Dioxin Excavation Contract | $2,622,750 |
| 15% Contingency | 393,412 |
| CONSTRUCTION SUBTOTAL | $3,016,162 |
| U.S. EPA Dioxin Building Contract 3 Storage Facilities | $ 225,000 |
| U.S. EPA Dioxin Polypropylene Bag Contract 2500 Bags | $ 100,000 |
| CONSTRUCTION/CLEAN-UP CONTRACTOR SUBTOTAL | $3,341,162 |
| **SAMPLING/OVERSITE COSTS** | |
| U.S. EPA Dioxin Lab Contract | |
| Soil Samples - 205 @ $200 | 41,000 |
| Air Samples - 175 @ $200 | 35,000 |
| U.S. EPA TECHNICAL ASSISTANCE TEAM | 225,000 |
| 15% Contingency | 33,750 |
| SUBTOTAL | 334,750 |
| TOTAL (EXTRAMURAL) | 3,675,912 |
| **U.S. EPA COSTS** | |
| Labor | $ 55,575 |
| Overhead | 155,000 |
| Travel | 50,000 |
| SUBTOTAL | $ 260,575 |
| TOTAL (INTRAMURAL) COST | $ 260,575 |
| TOTAL PROJECT COST | $3,936,487 |

## 4.2 STRUCTURES

Previous sampling has not shown contamination inside a nearby residence but extensive contamination inside the arena structure exists. Because of the threats discussed above, this contaminated material will be removed by a combination of dry abrasive blasting and HEPA vacuum while the structure is maintained under a negative pressure so contamination is not spread to outside areas.

## 4.3 STORAGE

The storage structures to be used for the temporary consolidation of the contaminated soil and debris will be constructed to satisfy the applicable storage structure requirements of 40 CFR Part 264 Subpart I issued pursuant to the Resource Conservation and Recovery Act (RCRA). The foundation of the storage structures will be constructed at an elevation above the 100 year flood level (479 MSL). The storage consists of subgrade preparation and placement of a multi-layer rolled asphaltic floor with a continuous 8-inch asphaltic curb with sealer applied. A wood-framed, steel-sided building will be constructed over the entire floor and curb area. These storage structures will be located inside a separate fenced and posted area for the duration of the storage period. Following completion of the removal activity, regular scheduled inspections of the structures, fence system and condition of the stored material will be conducted.

## 4.4 HEALTH AND SAFETY

A health and safety plan, similar to plans prepared and used satisfactorily at other eastern Missouri dioxin sites, will be prepared for the Shenandoah Stables site and implemented during the non-final remedial action. An air monitoring program will be implemented prior to initiation of excavation and continued throughout the active excavation phases of the project to monitor any offsite migration of potentially contaminated dust. All active portions of the site and unsecured storage buildings will be monitored during non-work hours by trained security personnel operating from an office on the storage structure grounds. Security during the active project phases will insure that no unauthorized personnel will be allowed access to the site. Contingency plans have been prepared in the event that natural or technological events cause the unplanned release or potential release of hazardous materials at the site.

## 4.5 TIME SCHEDULE

It is estimated that the entire action will take 150 work days (25 weeks) from the beginning of the initial onsite mobilization. Thirteen weeks are allowed for excavation of the contamination and an additional three weeks for completion of restoration and demobilization.